FlyBy Math™ Alignment
Mathematics Grade Expectations

Standard 7.6: Arithmetic, Number, and Operation Concepts

Grade Expectations	*FlyBy Math*™ Activities
M7: 4 Accurately solves problems involving proportional reasoning; percents involving discounts, tax, or tips; and rates. M(N&O)-7-4	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.
M7: 7 Estimates and evaluates the reasonableness of solutions appropriate to grade level.	--Predict outcomes and explain results of mathematical models and experiments.

Standard 7.7: Geometry and Measurement Concepts

Grade Expectations	*FlyBy Math*™ Activities
M7: 15 Measures and uses units of measures appropriately and consistently when solving problems across the content strands. Makes conversions within systems.	--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.

Standard 7.8: Functions and Algebra Concepts

Grade Expectations	*FlyBy Math*™ Activities
M7: 19 Identifies and extends to specific cases a variety of patterns (linear and nonlinear) represented in models, tables, sequences, graphs, or in problem situations; **and generalizes** a linear relationship using words and symbols; generalizes a linear relationship to find a specific case; or writes an expression or[sc] equation using words or[sc] symbols to express the **generalization** of a nonlinear relationship. M(F&A)–7–1	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
M7: 20 Demonstrates conceptual understanding of linear relationships ($y = kx$; $y = mx + b$) **as a constant rate of change** by solving problems involving the relationship between slope and rate of change, by describing the meaning of slope in concrete situations, or informally determining the slope of a line from a table or graph; **and distinguishes between constant and varying**	--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

rates of change in concrete situations represented in tables or graphs; **or describes how change in the value of one variable relates to change in the value of a second variable** in problem situations with constant rates of change. M(F&A)–7–2	--Interpret the slope of a line in the context of a distance-rate-time problem.

Standard 7.9: Data, Statistics, and Probability Concepts

Grade Expectations	***FlyBy Math*™ Activities**
M7: 23 Interprets a given representation (circle graphs, scatter plots that represent discrete linear relationships, or histograms) to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: *Analyzes data consistent with concepts and skills in M7: 24*.) M(DSP)–7–1 And (frequency charts, tables, bar graphs, pictographs, Venn diagrams, line plots,) histograms).	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
M7: 25 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in M7: 23. M(DSP)–7–3 **Organizes and displays data using** line graphs or histograms, bar graphs, tables, frequency tables, line plots, and stem-and-leaf plots to answer question related to the data, to analyze the data to formulate or justify conclusions, or to make predictions (IMPORTANT: *Analyzes data consistent with concepts and skills in M7: 24*.)	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
M7: 28 In response to a teacher - or student-generated question, makes a hypothesis, collects appropriate data, organizes the data, appropriately displays/represents numerical and/or categorical data, analyzes the data to draw conclusions about the questions or hypothesis being tested, and when appropriate makes predictions, asks new questions, or makes connections to real-world situations. (IMPORTANT: *Analyzes data consistent with concepts and skills in M7: 24*.)	--Conduct simulation and measurement for several aircraft conflict problems. --Represent distance, rate, and time data using tables, line plots, bar graphs, and line graphs. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.

Standard 2.5: Mathematical Dimensions, Standard 7.10: Mathematical Problem Solving and Reasoning - Applications	
Grade Expectations **M7: 30 Demonstrate understanding of mathematical problem solving and communication through:** • **Approach & Reasoning**—The reasoning, strategies, and skills used to solve the problem; • **Connections**—Demonstration of observations, applications, extensions, and generalizations; • **Solution**—All of the work that was done to solve the problem, including the answer; • **Mathematical Language**—The use of mathematical language in communicating the solution; • **Mathematical Representation**—The use of mathematical representation to communicate the solution; and • **Documentation**—Presentation of the solution.	***FlyBy Math™* Activities** --Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.